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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,708	02/11/2004	Eric J. Alexander	WIE-019	3430

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65 Woods End Road  
Stamford, CT 06905

EXAMINER
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ENSEY, BRIAN

ART UNIT	PAPER NUMBER
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2615

DATE MAILED: 08/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/776,708

Applicant(s)

ALEXANDER ET AL.

Examiner

Brian Ensey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3-19 and 21-29 is/are rejected.
- 7) ☒ Claim(s) 2 and 20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION*****Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 3, 4, 5, 7, 9-14, 19 and 21-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maekawa et al. U.S. Patent No. 3,867,586 in view of Klayman U.S. Patent No. 3,930,561.

Regarding claim 1, Maekawa discloses an audio speaker system comprising: a speaker driver for reproducing sound within an extended frequency range that includes a high frequency band between 8 kHz and 11 kHz (See Fig. 2); and a horn (5) disposed adjacent said speaker driver (See Figs. 2 and 3 and col. 2, lines 32-54). Maekawa does not expressly disclose a horn that has an axi-symmetrical waveguide surface with an annular cross-section, said waveguide surface dispersing sound within the extended frequency range at a dispersion angle greater than 90 degrees. However, Maekawa does not limit the shape of the horn. Klayman teaches a horn (10) that has an axi-symmetrical waveguide surface with an annular cross-section (14), said waveguide surface dispersing sound within the extended frequency range at a dispersion angle greater than 90 degrees (See Figs. 1-4 and the abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the horn of Klayman in the speaker of Maekawa to provide a smooth frequency response at high frequencies over a wide dispersion angle (See Klayman col. 1, lines 26-30 and 42-44).

Regarding claim 19, Maekawa discloses an audio speaker system comprising: a speaker driver for reproducing sound within an extended frequency range that includes a

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high frequency band between 8 kHz and 11 kHz (See Fig. 2); and a horn (5) disposed adjacent said speaker driver (See Figs. 2 and 3 and col. 2, lines 32-54). Maekawa does not expressly disclose a horn that has an axi-symmetrical waveguide surface which is curvilinear with a smooth flare rate, said waveguide surface dispersing sound within the extended frequency range at a dispersion angle greater than 90 degrees. However, Maekawa does not limit the shape of the horn. Klayman teaches a horn (10) that has an axi-symmetrical waveguide surface which is curvilinear with a smooth flare rate (14), said waveguide surface dispersing sound within the extended frequency range at a dispersion angle greater than 90 degrees (See Figs. 1-4 and the abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the horn of Klayman in the speaker of Maekawa to provide a smooth frequency response at high frequencies over a wide dispersion angle (See Klayman col. 1, lines 26-30 and 42-44).

Regarding claims 3 and 21, the combination of Maekawa in view of Klayman does not expressly disclose the extended frequency range includes a wide frequency band between 2 kHz and 11 kHz. However, the combination of Maekawa in view of Klayman teaches a range of 2.4 kHz to 15 kHz and does not limit the frequency response to this specific range (See col. 2, lines 9-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the horn of the combination of Maekawa in view of Klayman to cover the entire human audible frequency range including 2 kHz to 11 kHz.

Regarding claim 4 and 22, the combination of Maekawa in view of Klayman does not expressly disclose the extended frequency range includes a wide frequency band

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between 800 Hz and 11 kHz. However, the combination of Maekawa in view of Klayman teaches a range of 2.4 kHz to 15 kHz and does not limit the frequency response to this specific range (See col. 2, lines 9-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the horn of the combination of Maekawa in view of Klayman to cover the entire human audible frequency range including 800 Hz to 11 kHz.

Regarding claim 5, the combination of Maekawa in view of Klayman further discloses said waveguide surface has a throat disposed substantially adjacent said speaker driver, a mouth disposed opposite said throat, and a radial dimension that increases curvilinearly from said throat to said mouth (See Klayman Figs. 3 and 4 and col. 1, lines 31-36).

Regarding claim 7, the combination of Maekawa in view of Klayman further discloses a portion of said waveguide surface has length that is exponentially related to the area of its mouth (See Klayman Figs. 3 and 4 and col. 2, lines 59-62).

Regarding claim 8, the combination of Maekawa in view of Klayman further discloses a portion of said waveguide surface is curvilinear with a smooth flare rate (See Klayman Figs. 3 and 4).

Regarding claims 9-11, the combination of Maekawa in view of Klayman does not expressly disclose the length of said waveguide surface is approximately 1.125 inches, the area of said throat is approximately 0.192 square inches or the area of said mouth is approximately 1.777 square inches. However, the combination of Maekawa in view of Klayman teaches a speaker of small dimensions comprising a waveguide length of 3.95 inches, a throat of .28 square inches and a mouth area of 2.25 square inches (See

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Klayman col. 2, lines 33-58). The combination of Maekawa in view of Klayman does not limit the size of the speaker unit and teaches that the unit may be scaled up or down for use in other frequencies and to provide other gains (See Klayman col. 2, lines 9-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the dimensions of the speaker of the combination of Maekawa in view of Klayman to meet a variety of frequency ranges and gains (See Klayman col. 2, lines 9-15).

Regarding claims 12 and 23, the combination of Maekawa in view of Klayman further discloses said speaker driver includes a radiating dome-shaped surface (7) (See Maekawa Fig. 3).

Regarding claims 13 and 24, the combination of Maekawa in view of Klayman further discloses said speaker driver is rear-vented (61, 71a) into a rear chamber that dissipates low frequency sound components (See Fig.4 and col. 2, lines 55-63).

Regarding claims 14 and 25, the combination of Maekawa in view of Klayman further discloses an annular gasket (6) disposed in annular grooves outside a throat area of said horn (See Maekawa Fig. 3 and col. 2, lines 55-63).

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maekawa in view of Klayman as applied to claim 1 above, and further in view of Perkins PCT WO 99/04599.

Regarding claim 6, the combination of Maekawa in view of Klayman does not expressly disclose a portion of said waveguide surface defines a tractroid surface. However, the combination of Maekawa in view of Klayman teaches the horn may be made of a conical section and an exponential section and the flare of the conical or

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exponential section may be changed for efficiently reproducing high frequency sound (See col. 3, line 39 to col. 4, line 6). It is well known in the art to combine multiple flare contours including a tractrix contour and Perkins teaches a horn comprising three different flare rates including a tractrix flare rate (See Perkins abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize multiple flare rates on the speaker horn of the combination of Maekawa in view of Klayman to control the beaming of the sound output.

Claims 15 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Maekawa in view of Klayman as applied to claims 1 and 19 above, and further in view of Dodd U.S. Patent No. 6,116,373.

Regarding claims 15 and 26, the combination of Maekawa in view of Klayman discloses a speaker system with a gasket as claimed. The combination of Maekawa in view of Klayman does not expressly teach the content of his annular gasket is formed from a foam material. However, the use of closed cell foam gaskets for sound absorption is well known in the art and Dodd teaches a foam gasket for use on the connecting flange of a horn loudspeaker for sound absorption (See col. 1, lines 43-46 and lines 58-63). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the closed cell foam gasket of Dodd for the gasket of the combination of Maekawa in view of Klayman for vibration damping and sound absorption and to obtain a flatter frequency response characteristic (See Maekawa col. 3, lines 14-31).

Claims 16 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maekawa in view of Klayman as applied to claims 1 and 19 above, and further in view of Larsen et al. U.S. Patent No. 5,701,358.

Regarding claims 16 and 27, the combination of Maekawa in view of Klayman does not expressly disclose said speaker driver comprises a ring-shaped neodymium magnet. However, the use of a ring-shaped neodymium magnet in a speaker magnetic drive circuit is well known in the art and Larsen teaches a speaker magnetic drive circuit utilizing a ring-shaped neodymium magnet (162) (See Fig. 8 and col. 9, lines 35-38). It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize a ring-shaped neodymium magnet in the drive circuit of the combination of Maekawa in view of Klayman to enhance the magnetic flux in the vicinity of the voice coil (See Larsen col. 9, lines 35-38).

Claims 17 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Maekawa in view of Klayman as applied to claims 1 and 19 above, and further in view of Espiritu U.S. Patent No. 6,002,780.

Regarding claims 17 and 28, the combination of Maekawa in view of Klayman discloses a speaker system with a gasket as claimed. The combination of Maekawa in view of Klayman does not expressly teach said speaker driver and horn are disposed coaxially with a low frequency speaker to thereby realize an integrated multi-element system. However, the use of coaxially aligned speakers for improved sound fidelity over a wide frequency range is well known in the art and Espiritu teaches a high frequency speaker mounted coaxially with a low frequency speaker (See Fig. 1 and col. 1, lines 51-63). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to mount the audio speaker of the combination of Maekawa in view of Klayman coaxially in the center of the low frequency speaker of Espiritu for an improved frequency response and reduced space.



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Claims 18 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Maekawa in view of Klayman as applied to claims 1 and 19 above, and further in view of Thiele U.S. Patent Application Publication 2003/0002694.

Regarding claims 18 and 29, the combination of Maekawa in view of Klayman discloses a speaker system with as claimed. The combination of Klayman in view of Maekawa does not expressly teach cross-over circuitry, operably coupled to said speaker driver, that provides high pass filtering with a cutoff frequency corresponding to the extended frequency range of said speaker driver. However, the use of cross-over circuitry for filtering in a speaker system is well known in the art and Theile teaches a cross-over filter for providing a high pass filter function in a speaker system (See paragraph 0016). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize a cross-over filter to operate the speaker system of the combination of Maekawa in view of Klayman in the desired operating frequency range.

#### ***Allowable Subject Matter***

Claims 2 and 20 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Response to Arguments***

Applicant's arguments with respect to claims 1-29 have been considered but are moot in view of the new ground(s) of rejection.

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***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Ensey whose telephone number is 571-272-7496. The examiner can normally be reached on Monday - Friday 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on 571-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Brian Ensey  
Examiner  
July 27, 2006